Transforming Your Data Center

Dual-Core Itanium® 2-based Servers

Transform Your Business-Critical Infrastructure with Dual-Core Itanium® 2-based Servers

With the rush of new information technology, the opportunities to achieve agility and true business advantage have never been greater. Successful companies are making strategic IT decisions to help them achieve competitive advantage through faster development cycles, better products, improved operating results, and more satisfied customers.

Of course, new IT investments don't automatically translate to better business performance. Solutions that combine innovative business processes with the right IT infrastructure at the most strategic level are key. These are the solutions with the power to transform. And these are the solutions that the Itanium® processor-based platform enables.

Your critical business applications demand premier performance and the most reliable, flexible, and advanced infrastructure, making the new Dual-Core Itanium® 2-based servers the right choice, with scalable performance, mainframe-class reliability, and unbeatable flexibility.

Proven Performance and Mainframe-Class Reliability

New Dual-Core Itanium 2-based servers provide new levels of performance, reliability, and cost-effective scalability for your most data-intensive computing needs, offering more reasons than ever to choose Intel® standards-based architecture over RISC-based and legacy mainframe systems.

The Dual-Core Intel® Itanium® 2 processor 9000[4] series delivers up to double the performance of yesterday's processor,[1] Hyper-Threading Technology,[†] hardware-assisted Intel® Virtualization Technology,[◆] Intel® Cache Safe Technology, Enhanced Machine Check Architecture, and as much as 20 percent lower power consumption[‡], freeing you from the limitations of proprietary architectures while delivering the "always on" service levels of mainframe-class systems.

Unbeatable Flexibility and Choice

Itanium 2-based servers are the only 64-bit servers on the market that support 10 different operating systems, including Microsoft Windows Server* 2003; Linux* from SuSE, Red Hat, Red Flag, and other distributions; HP NonStop*; OpenVMS* and HP-UX.* And with more than 8,000 applications[2] available from vendors such as Microsoft, BEA, IBM, Ansys, Gaussian, Symantec/Veritas, Oracle, SAP, and SAS, you can be confident your business-critical applications are supported.

Industry-leading hardware vendors and solution providers from around the globe offer Itanium®-based solutions, ensuring competitive pricing, the broadest range of options, and the top-level support you need to transition from RISC and legacy mainframe systems to standards-based architecture.

Driving Cost-Effective Legacy Migration

To provide a low-cost, low-risk path to moving legacy applications onto more cost-effective standards-based architecture, Intel is working with Transitive (www.transitive.com) and leading server vendors to offer Itanium-based systems that can run Sun Solaris*-based applications and other applications compiled for RISC-based systems, with no code changes and near-native performance.

Intel is also working with Platform Solution, Inc. (www.platform-solutions.com), which has introduced Itanium-based servers that can run the IBM z/OS* and OS/390* operating systems, as well as Linux, UNIX,* and Windows. This is yet another path to mainframe modernization and a way of preserving the value of legacy applications.

Value for Today and Tomorrow

Dual-Core Intel Itanium 2 processors continue the Intel® Itanium® processor family legacy of providing extremely attractive price/performance for data-intensive applications. They provide mainframe-class performance and reliability without the mainframe price tag.

With global industry support and future advances already in development, your Itanium 2-based server investment will continue to deliver performance improvements that enable long-term business growth along with outstanding value and investment protection.

Itanium 2-based servers prove themselves every moment of the day in 9 of the 10 largest companies in the world and for more than 70 percent of the *Fortune* Global 100 enterprises.[3]

"We have relied on high performance and cost-effective Intel® Itanium® 2 processors to power our critical CFD software simulations since 2003. These calculations are essential for the design modifications of our Formula One racecar. For Toyota to keep ahead and succeed in Formula One, we need to accelerate our design-to-manufacture cycle even further. From initial tests, we anticipate that the new Dual-Core Intel® Itanium® 2 processor will deliver performance gains of up to 35% for our CFD simulations when our software stack is fully optimised. This will enable us to implement changes to the car design much more rapidly, thus increasing our competitive edge on and off the racetrack."

— Elmar Huebner, Manager of IT, Toyota Motorsport

Optimized for Analytic Applications and Data-Intensive Computing

Designed specifically for the most demanding enterprise applications, such as business intelligence (BI), enterprise databases and data warehousing, enterprise resource planning (ERP), supply chain management (SCM), and high-performance computing (HPC) applications, the Dual-Core Intel Itanium 2 processor handles the heaviest workloads at a far lower cost than proprietary offerings.

With up to 24 megabytes of on-die L3 cache, Hyper-Threading Technology, and dual-core processing, the new Dual-Core Intel Itanium 2 processor delivers premier price/performance and up to double the performance of yesterday's processor,[1] easily handling:

- Computationally intensive workloads
- High transaction volume
- Real-time reporting and analytics
- Sophisticated business intelligence applications
- Complex data-mining algorithms

Intel® Itanium® architecture – standards-based Explicitly Parallel Instruction Computing (EPIC) technology – provides the highest levels of compute parallelism, massive caches, and processor execution resources for your data-intensive applications. Intel Cache Safe Technology delivers new levels of application reliability, minimizing cache errors and helping ensure mainframe-caliber availability. And Intel Virtualization Technology, combined with advanced system capabilities, allows IT to create multiple virtual machines in a single server and securely run multiple operating systems and dozens of applications.

The Intel Itanium 2 processor also supports best-in-class data center security with faster data encryption, robust memory compartmentalization (via enhanced paging architecture), hardware authentication of firmware, and protected in-band configuration management. Plus, its extreme scalability provides the headroom that enables continued growth and agility. As your workloads expand, you'll be able to incrementally add processors (scale up) or servers (scale out) for flexible growth.

Improve your time-to-information and real-time business decision making by choosing cost-effective, highly reliable Dual-Core Itanium 2-based servers.

Powering Business Intelligence Solutions

With high levels of compute parallelism, massive caches, and one petabyte of addressable memory, the Dual-Core Intel Itanium 2 processor delivers optimal performance for sophisticated business intelligence applications, enabling deeper real-time analysis and reporting of enormous amounts of data. Drive efficiency into your business intelligence analytics with the extreme computational capabilities of Dual-Core Itanium 2-based servers.

MKB strengthens its competitive edge

MKB, one of Hungary's top three banks, wished to support its growth strategy and stay ahead of the market by acquiring more companies and customers. To that end, it invested in a powerful and highly reliable Intel Itanium 2 processor-based platform to power three business-critical applications – Globus core banking software, SAS business intelligence programs, and Internet banking.

Faster reports; increased efficiency

Intel Itanium 2 architecture at MKB saves the company three hours on each batch of SAS business reporting, enhancing business intelligence, while the real-time visibility of internal operations enables better decision making and faster identification of business opportunities. They've also been able to streamline operations by centralizing all bank details onto Globus running Intel Itanium processor-based servers, and have increased the speed of personal online banking by 50%, all while experiencing 100% uptime in the 18 months since deployment.

"Since switching essential applications to an Intel® Itanium® 2 platform, we have seen significant improvement in performance and processing speed."

— László Bessenyei, General Manager of IT Operations, MKB

Powering Reliable and Scalable Database Solutions

Dual-Core Itanium 2-based systems speed high transaction volumes and help analyze, reference, and report on terabytes of data quickly and cost efficiently. Reduce the time required to scale databases to run on 64-bit platforms and achieve high levels of scalability for memory-intensive data applications with the Dual-Core Itanium 2-based platform, optimized for Oracle 10*g** for HP-UX and Linux, Microsoft SQL Server* 2005 Enterprise Edition (64-bit), and IBM DB2* UDB v.8.2 for Microsoft Windows Server* 2003 and Linux.

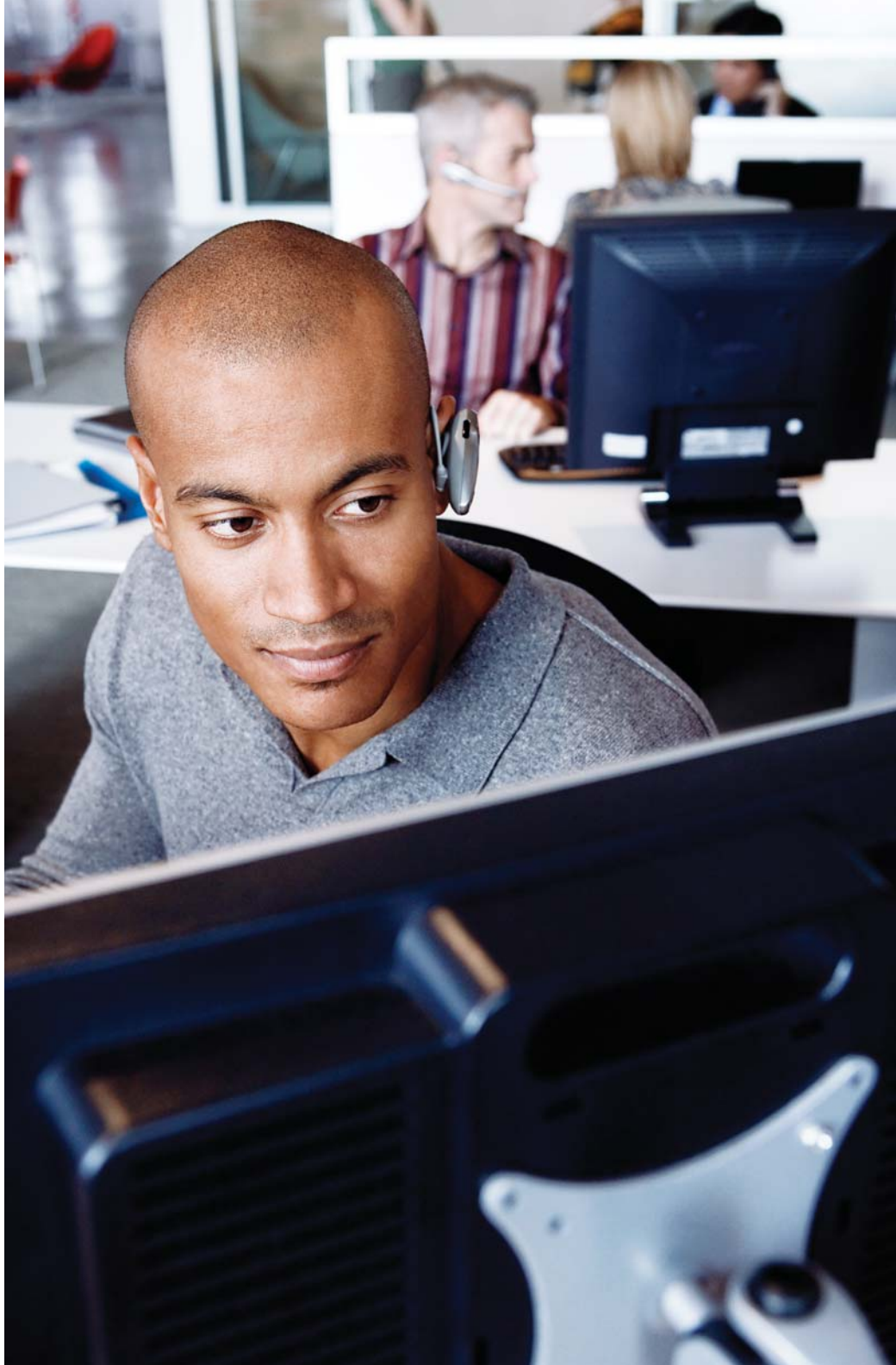
MGM MIRAGE increases database performance 4x

MGM MIRAGE, which owns some of the best-known properties in Las Vegas, needed exactly the kind of scalability and performance offered by the Intel Itanium 2 processor to handle its rapid growth. MGM MIRAGE's business-critical data warehouse, consisting of over 125 databases running mostly on separate servers and 32-bit architecture, had become unmanageable and expensive to maintain. This data warehouse is critical to MGM MIRAGE's business success, containing more than a terabyte of data and processing 400 million transactions a day.

Fourfold performance increase at less cost than RISC

By consolidating servers and migrating to Itanium 2-based systems, MGM MIRAGE experienced a fourfold increase in performance. Activities that used to take hours are completed in minutes, and MGM MIRAGE now has the headroom and throughput to support the company's rapid growth and demanding transaction requirements.

> "On comparable RISC solutions, the costs were two to three times higher than what we could do in the Intel space."
>
> — Glenn Bonner, CIO, MGM MIRAGE



Powering Enterprise Resource Planning (ERP) Solutions

Performance of demanding ERP applications such as the mySAP* ERP system heavily depends on large memory support and high system bandwidth, both available with the Dual-Core Intel Itanium 2 processor. The capability of the Intel Itanium 2 processor to address up to 1,024 terabytes of physical memory allows ERP models such as this to scale up with virtually no ceiling, providing rapid data access and smooth analysis, while offering tremendous headroom for growth. The world-class performance of ERP solutions running on Itanium 2-based platforms deliver outstanding results and business value.

Astra Motor III drives breakthrough performance

Astra Motor III (ASMO), a subsidiary of the largest conglomerate in Indonesia, PT Astra International, manufactures vehicles in partnership with world-leading marques. ASMO began experiencing a large increase in demand across its production lines, but its back-end ERP systems were already running at 70 percent CPU utilization. An IT infrastructure upgrade was needed in record time, but one that would not disrupt current production, involve a large IT investment, or require migrating away from ASMO's current SAP applications.

5x production increase, 65 percent reduction in TCO

ASMO replaced its legacy systems with multiple Itanium 2-based servers and migrated its 2.5-terabyte database in just 30 hours – over a weekend – without impacting its manufacturing operations. ASMO calculated that the Itanium 2-based systems reduced the company's total cost of ownership by up to 65 percent over its previous system. Since implementing the Itanium 2-based systems, ASMO increased production capacity from 2,000 to 10,000 assembled cars per month.

> "It is very important that the hardware be well matched to the software. We found that Intel® architecture-based servers work very well with SAP. This cost-effective solution has exceeded our performance expectations."
>
> — Rudy Taurany, CIO, Astra Motor III

Powering High-Performance Computing (HPC) Solutions

The Dual-Core Intel Itanium 2 processor delivers Intel's highest floating-point performance, scalability, and reliability for the most complex HPC scientific, industrial, and enterprise challenges. Dual-Core Itanium 2-based systems are ideal for scaling up symmetric multiprocessing (SMP) solutions in supercomputers to thousands of processors, and for the large compute farms found in high-performance technical computing environments.

"A key objective of the CEA is to guarantee the safety and reliability of French nuclear weapons without resorting to nuclear tests, and we achieve this by generating highly complex simulations on our supercomputing facilities. With the recent installation of a cluster of 4,352 Dual-Core Intel® Itanium® 2 processors, we have created the most powerful supercomputer in Europe, the TERA-10, providing us with a 50 teraflops (50,000 billion operations per second) peak computing power.

This new dual-core processor marks a significant advance for the Intel Itanium processor family, bringing CEA up to new levels of highly parallel computing capability, reliability and scalability. Not only is Intel continuing to deliver innovation at the hardware level, but it is also working with us to ensure that software and applications can easily be optimized for our new platforms."

— Pierre Leca, Head of Computer Science Department, CEA

Powering RISC Replacement

The complexity, inflexibility, and high cost of software and maintenance of RISC-based and legacy mainframe systems are driving enterprises worldwide to standards-based architecture like the Intel Itanium 2 platform. Dual-Core Itanium 2-based servers offer a much broader choice in operating systems, applications, and global vendor support than proprietary architectures and mainframe systems, and at a lower cost. Standards-based platforms also allow easier adoption of new technologies and software, and the ability to quickly scale or consolidate to meet changes in demand.

Sompo Japan speeds processing, reduces maintenance costs

Sompo Japan Insurance, Inc., is one of Japan's leading insurance providers. Its legacy RISC-based infrastructure could not keep up with growth and the performance demands on its multi-terabyte data warehouse containing 11 million insurance records – and growing. System response was slow and could not provide enough flexibility to analyze data from different perspectives. The aging system was also expensive to maintain, with hardware costs of the RISC-based servers being the largest portion of Sompo Japan's IT budget.

5x performance increase with Itanium 2-based servers

After careful analysis of competitive options, Sompo Japan replaced its RISC-based system with a cluster of Itanium 2-based servers. "The cost performance of Intel®-based servers is well known, and our selection of Intel Itanium 2 processors was based on a comprehensive evaluation, including consideration of the benefits of 64-bit processors," says Yoshikazu Kuroki, a Sompo Japan systems analyst.

Sompo Japan experienced a fivefold increase in extraction and analysis performance and a ninefold speedup in backups, all while lowering operating costs. Jobs that previously took all night to run are now completed in a few hours, and backups requiring 24 hours are now completed in 8 hours.

"Complaints from users due to [database] problems dropped very quickly. The speed of jobs such as batch processing, backups, and loads has also improved. A backup that previously took approximately 24 hours has now been reduced to around 8 hours despite a threefold increase in the volume of data. That's approximately a ninefold speedup."

– Mikio Ishikawa, User Support Group, Sompo Japan System Solutions

Worldwide Support from World-Class Suppliers

The Dual-Core Itanium 2-based platform inspires world-class design solutions and extensive optimization programs. With industry-leading OEMs, OSVs, and ISVs from around the globe developing and delivering Itanium 2-based systems and solutions, enterprises benefit from unparalleled choice, flexibility, and support.

To further accelerate the development and deployment of Dual-Core Itanium 2-based solutions, these industry-leading suppliers have formed the Itanium® Solutions Alliance (www.itaniumsolutionsalliance.org), a global organization committed to expanding Itanium 2-based offerings for enterprise and technical computing environments.

This consortium has committed $10 billion[4] to expanding Itanium-based solutions within enterprise and technical computing environments. For businesses and IT departments, this will mean faster time-to-implementation of the applications most critical to their new business needs, lower costs, and higher levels of system performance and application integration, as well as a broader choice of hardware and software vendors committed to the Intel® Itanium® 2 microarchitecture.

System Vendor Choice:	Operating System Choice:	Application Choice:
Fujitsu	Microsoft Windows Server* 2003	Microsoft
HP	Linux* from SuSE, Red Hat, and Red Flag	SAS
Fujitsu Siemens Computers	HP NonStop*	SAP
Bull	OpenVMS*	Oracle
SGI	HP-UX*	BEA
NEC	*and more*	*and more*
Unisys		
Hitachi		
and more		


Unbeatable flexibility and scalable performance
to power your data center
New Dual-Core Itanium 2-based servers deliver scalable performance, mainframe-class reliability, and unmatched flexibility for the most demanding enterprise applications, all at a fraction of the cost of RISC-based or legacy mainframe systems.
Make the move to Dual-Core Itanium 2-based servers today.
www.intel.com/go/itanium

[1] Performance measured using OLTP (NT/SQL), SPECjbb2005, SPECCPU, Linpack, and SAP-SD. Intel Internal Measurement (March 2006) comparing system configurations of Dual-Core Intel® Itanium® 2 processor 1.6 GHz with 24 MB L3 cache to Intel Itanium 2 processor 1.6 GHz with 9 MB L3 cache. Actual performance may vary. See http://www.intel.com/performance/server/itanium2.

[2] Intel internal data collected as of June 2006.

[3] Intel internal data source and FORTUNE Global 100 list.

[4] www.itaniumsolutionsalliance.org

[A] Intel processor numbers are not a measure of performance. Processor numbers differentiate features within each processor family, not across different processor families. See www.intel.com/products/processor_number <http://proto-cps.cps.intel.com/products/processor_number> for details.

[1] Hyper-Threading Technology (HT Technology) requires a computer system with an Intel® processor supporting HT Technology and an HT Technology enabled chipset, BIOS, and operating system. Performance will vary depending on the specific hardware and software you use. See www.intel.com/products/ht/hyperthreading_more.htm for more information including details on which processors support HT Technology.

[♦] Intel® Virtualization Technology requires a computer system with an enabled Intel® processor, BIOS, virtual machine monitor (VMM) and, for some uses, certain platform software enabled for it. Functionality, performance or other benefits will vary depending on hardware and software configurations and may require a BIOS update. Software applications may not be compatible with all operating systems. Please check with your application vendor.

Customer case studies referenced in this brochure can be in their entirety at www.intel.com/go/itanium.

Performance tests and ratings are measured using specific computer systems and/or components and reflect the approximate performance of Intel products as measured by those tests. Any difference in system hardware or software design or configuration may affect actual performance. Buyers should consult other sources of information to evaluate the performance of systems or components they are considering purchasing. For more information on performance tests and on the performance of Intel products, visit http://www.intel.com/performance/resources/limits.htm or call (U.S.) 1-800-628-8686 or 1-916-356-3104.All dates and products specified are for planning purposes only and are subject to change without notice.

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